S.E.A. Array

S.E.A. (Students for Environmental Action)
School of Natural Resources
Mendocino High School
Mendocino, CA
February 1, 2010

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S.E.A. Array Rationale

SEA (Students for Environmental Action) is a group of concerned citizens committed to the stewardship and conservation of marine life biodiversity and ocean resources. We recognize that we have evolved to be the only animals on our planet that can recognize how we affect the future. If we continue to focus on runaway economic growth, we forget that we are part of the natural world. Our obligation is not only to the well being of our species, but also to a sustainable future for this planet. We of the younger generation recognize that we are pivotal to ensuring the future of the Earth, and must begin by protecting our oceans.

SEA has developed an array of marine protected areas based on the best available scientific information, as well as interviews with local stakeholders including commercial and recreational fishermen, urchin and abalone divers, and seaweed harvesters. SEA proposes 14 marine protected areas (15.8% of the study region) along the north coast, including the protection of four of our local estuaries. The majority of our proposed protected areas meet the required goals and are especially focused on protecting the natural diversity of marine life found off our northern Californian coast, while aiming to have relatively minimal socio-economic impact. SEA recognizes that fish and other forms of marine life are sustainable resources, and that fisheries are important community assets. In all arrays it is expected that Traditional Tribal subsistence and ceremonial uses shall be allowed.

Our southern most MPA is Big River Estuary SMP. Big River Estuary is the longest unaltered, open-mouthed estuary in Northern California, which makes it an ideal ecosystem to protect. This proposed SMP protects the complex estuarine habitat, including eelgrass beds, marshlands, and mudflat ecosystems (G1, G2, G4), a significant nursery area for Dungeness crab, as well as numerous rockfish and flatfish species (G2). It protects an essential habitat for Black Brandt geese as well as a key foraging area for shorebirds, and coastal waterfowl (G2). It supports current DFG Coho and Steelhead salmon habitat conservation projects, creates a nursery for threatened anadromous fish including Pacific lamprey, and protects elephant seal molting haul-out sites (G2). Nearly the entire stretch of the estuary has access points making it more advantageous for research, long- term monitoring, and enforcement.

Traveling north we extended the current SMR off Point Cabrillo, clustering it with an SMCA which enlarges the existing Russian Gulch SMCA. By grouping the Russian Gulch SMCA with the Point Cabrillo SMR we have the ability to locate a substantially larger marine protected area that is both less economically constraining and more likely to serve the intended purpose of protecting biodiversity. In addition, SEA feels it is important to have educational and study opportunities. Having SMR and SMCA ecosystems side by side will allow one reserve to act as a control for biologists to compare the two areas.

Next we have the Ten Mile Reserve and Estuary reserve cluster. Like coral reefs and rainforests, estuaries are ecosystems with great biodiversity. The reserve and estuary covers a large variety of marine habitat, including shallow hard and soft bottom, kelp beds, rocky shore, mud flats, eelgrass, and marshland habitats. It protects larval sources and enhances the reproductive capacity of numerous invertebrate species (G1, G2, G4). It supports current DFG Coho and Steelhead salmon habitat conservation projects. It also creates a safe place for threatened anadromous fish (salmon species in particular) to move through the river mouth.

Further to the north, we propose Vizcaino SMCA. This will protect an area that is rich in numerous key habitats such as rocky shore and kelp, with a high diversity of benthic species characteristic of the north coast on both soft and hard bottoms (G1). This SMCA will help protect larval sources and enhance reproductive capacity of shelf species including rockfish(G2). Furthermore, this area will provide protection to an area that contains one of the most persistent and important upwelling plumes along the entire California coast and provides for significant downstream dispersal(G1). This dispersal will help restore depleted species, such as nearshore and deeper nearshore species(G2).

Next we propose the Punta Gorda SMR, an extension of the current Punta Gorda Reserve. This SMR captures a finger of the Mattole canyon, protecting an area of high benthic species diversity while maintaining species abundance (G1). It protects the natural trophic structure and food webs, including pelagic finfish that serve as prey for other fish, marine birds and marine mammals (G1). It also provides protection to an area that contains numerous rookeries for marine mammals and birds (G1, G2, G3).

Finally, past Punta Gorda, we have followed the proposals of our neighbors to the north using, and in some cases, slightly modifying the MPAs that were put forth by the North Coast Local Working Group. In addition, we have kept the False Klamath SMCA which was in one of their previous presented arrays. We removed the Eel River SMCA, and in it's place added the False Cape SMCA just to the south. These two changes were made to include more rocky shore habitat North of Punta Gorda.

SEA has aspired to an unbiased viewpoint and has welcomed comments and guest speakers representing a variety of interests throughout this whole process. Many of us have regularly attended MLPA, MOCA, and community meetings. We have diligently considered socio-economic interests, but see the supreme importance of creating "undersea Yosemites" to help ensure wild healthy oceans for future generations to use and enjoy. We believe that this array provides important protection for many marine species that exist in a variety of ecosystems, and could benefit local fishermen, urchin divers, and seaweed harvesters in the long term.

S.E.A. (Students for Environmental Action), School of Natural Resources,
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California Marine Life Protection Act Initiative
MLPA North Coast Study Region: Round 1 Evaluations
Staff Summary of Area and Habitats in External Proposed MPA Array E
Date Created: March 5, 2010

Table 1. Summary of MPAs by Designation for External Proposed MPA Array E

Type of MPA[a]	# of MPAs	Area (mi^2)	% of Study Region
State Marine Reserve (SMR)	6	85.55	8.3%
State Marine Recreational Managed Area (SMRMA)	1	2.44	0.2%
State Marine Park (SMP)	1	0.34	0.0%
State Marine Conservation Area (SMCA)	8	74.52	7.3%
All MPAs combined	16	162.84	15.9%

[a] These are proposed marine protected area (MPA) designations, NOT levels of protection assigned by the MLPA Master Plan Science Advisory Team (SAT). SMRMA is not an MPA designation, but rather a marine managed area designation.

Table 2. Summary of MPAs by Level of Protection for External Proposed MPA Array E

Level of Protection (LOP)	# Proposed	Area (mi^2)	% of Study Region
Very High[b]	7	87.99	8.6%
High	1	0.20	0.0%
Moderate-High	5	69.63	6.8%
Moderate	0	0.00	0.0%
Low[c]	3	5.02	0.5%
Total	16	162.84	15.9%

[b] The “Very High” category includes MPAs with SMR designation, as well as SMRMA designations.

[c] The “Low” category groups together MPAs that are assigned a moderate-low and low level of protection.

Table 3. Individual MPAs in External Proposed MPA Array E

MPA Name	Size[d] (mi²)	Alongshore Span[e] (mi)	Depth Range[f] (ft)
Pyramid Point SMR	20.93	4.7	0 - 124
Pyramid Point SMCA[g]	0.20	3.4	0 - 3
False Klamath SMCA	20.98	4.7	0 - 126
Reading Rock SMR	18.64	6.3	90 - 253
Reading Rock SMCA	9.52	3.0	0 - 101
South Humboldt Bay SMRMA	2.44	N/A	Depth data not available
False Cape SMCA	15.20	3.6	0 - 155
Punta Gorda SMR	25.96	6.4	0 - 1667
Vizcaino SMCA	23.59	6.3	0 - 395
S.E.A. Ten Mile SMR	15.08	3.9	0 - 344
S.E.A. Ten Mile Estuary SMR	0.19	N/A	Depth data not available
MacKerricher SMCA	0.72	3.0	0 - 38
Point Cabrillo SMR	4.76	1.3	0 - 404
Russian Gulch SMCA	4.27	1.1	0 - 402
Big River Estuary SMP	0.34	N/A	Depth data not available
Van Damme SMCA	0.02	0.2	0 - 11

[d] Statue mile is the unit of measurement used for this analysis.

[e] Alongshore span measured as direct line from one end of the MPA to the other, roughly paralleling the coastline. An alongshore span is not calculated for estuarine MPAs

[f] Comprehensive bathymetric data for all estuaries is not available. Though bathymetric data do exist in portions of some estuaries, depth ranges are not provided for estuarine MPAs for consistency in evaluations.

[g] Tribal uses are proposed in this MPA. However, pending further policy guidance, these uses are not currently considered in assigning the level of protection for this MPA.

Table 4. Habitat Representation in External Proposed MPA Array E

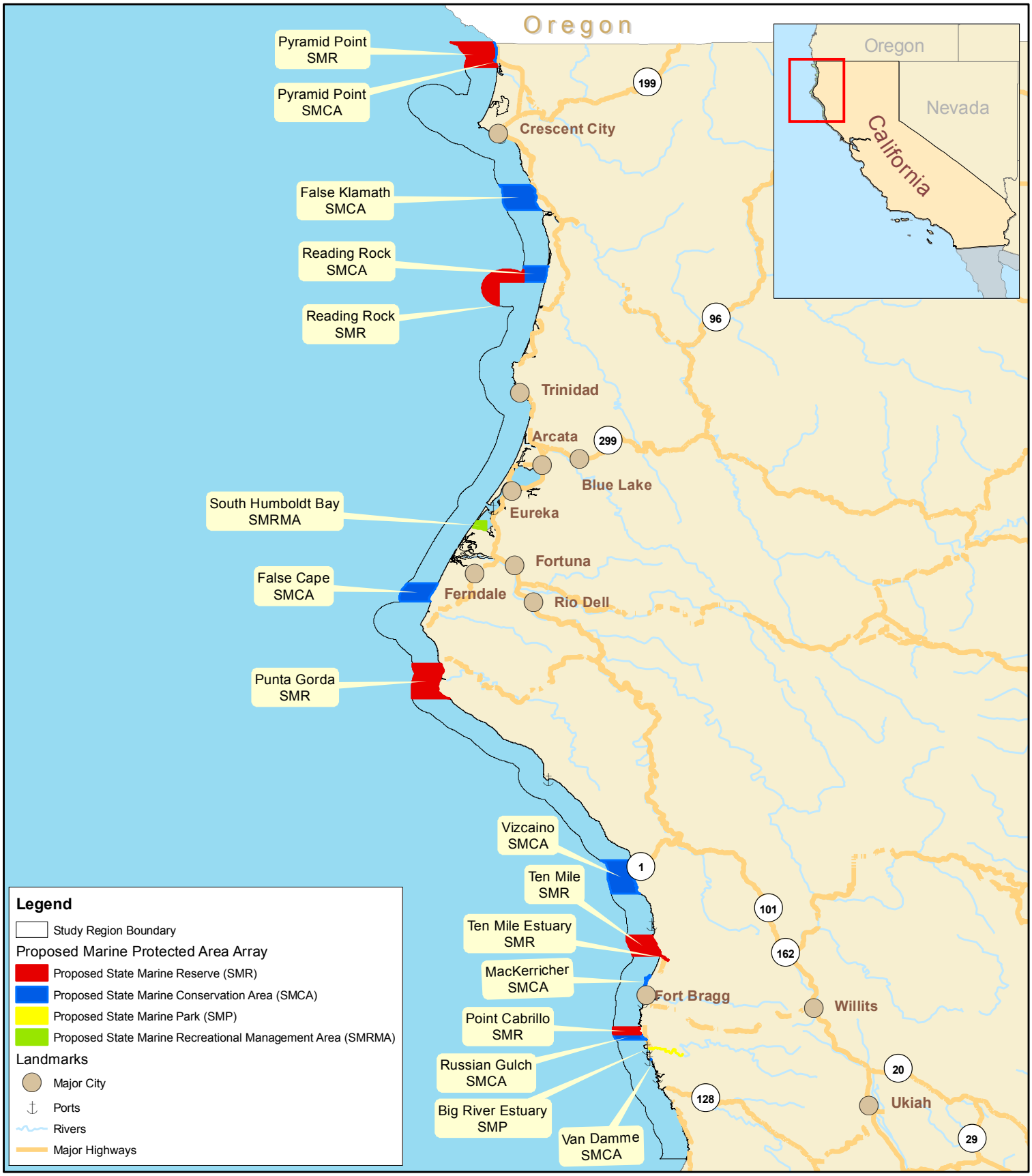
	SMR		SMRMA		SMP		SMCA		Total MPAs	
Habitat[h]	Area	%	Area	%	Area	%	Area	%	Area	%
Intertidal										
Sandy or gravel beach*	5.43	3%	0.00	0%	1.10	1%	20.27	11%	26.80	15%
Rocky shores*	18.16	11%	0.28	<1%	0.76	<1%	15.29	10%	34.49	22%
Hardened shores*	0.00	0%	0.00	0%	0.00	0%	0.25	1%	0.25	1%
Coastal marsh*	2.30	3%	2.25	3%	3.55	4%	0.00	0%	8.10	9%
Coastal marsh	0.05	1%	0.05	1%	0.05	1%	0.00	0%	0.15	4%
Tidal flats*	0.00	0%	0.86	1%	0.28	<1%	0.00	0%	1.14	2%
Seagrass beds										
Humboldt Eelgrass	0.00	0%	0.92	13%	0.00	0%	0.00	0%	0.92	13%
Estuarine										
Estuary	0.19	<1%	2.44	6%	0.34	1%	0.00	0%	2.96	7%

	SMR		SMRMA		SMP		SMCA		Total MPAs	
Habitat[h]	Area	%	Area	%	Area	%	Area	%	Area	%
Hard bottom										
0-30 meters proxy*,[i]	5.00	9%	0.00	0%	0.00	0%	3.97	7%	8.97	17%
0-30 meters	3.43	8%	0.00	0%	0.00	0%	2.83	7%	6.26	15%
30-100 meters	3.74	8%	0.00	0%	0.00	0%	0.25	1%	3.98	9%
100-200 meters	0.31	31%	0.00	0%	0.00	0%	0.00	0%	0.31	32%
>200 meters	0.05	52%	0.00	0%	0.00	0%	0.00	0%	0.05	52%
Soft bottom										
0-30 meters proxy*, [i]	12.15	8%	0.00	0%	0.00	0%	11.91	7%	24.05	15%
0-30 meters	19.16	8%	0.00	0%	0.00	0%	21.70	9%	40.86	16%
30-100 meters	44.08	10%	0.00	0%	0.00	0%	24.38	6%	68.46	16%
100-200 meters	5.76	9%	0.00	0%	0.00	0%	5.77	9%	11.53	18%
>200 meters	2.40	31%	0.00	0%	0.00	0%	0.00	0%	2.40	31%
Unknown										
0-30 meters proxy*, [i]	0.00	0%	0.00	0%	0.00	0%	3.02	16%	3.02	16%
0-30 meters	6.30	4%	2.44	1%	0.20	<1%	10.24	6%	19.18	12%
30-100 meters	0.32	1%	0.00	0%	0.00	0%	9.35	35%	9.66	36%
100-200 meters	0.00	0%	0.00	0%	0.00	0%	0.00	0%	0.00	0%
>200 meters	0.02	10%	0.00	0%	0.00	0%	0.00	0%	0.02	10%
Other										
Offshore rocks*	9.84	7%	0.00	0%	0.00	0%	13.20	9%	23.05	16%
Linear kelp*	4.13	8%	0.00	0%	0.00	0%	3.35	6%	7.48	14%

[h] Note: Habitats are measured as an area (mi^2) except for those with a * notation. Habitats with a * notation are expressed in linear units (mi).

[i] There is limited fine scale data for nearshore habitat, shallower than 10-20 meters depth, in the north coast study region. A proxy for this area was created using a line parallel to the coast and classifying the substrate as either hard or soft substrate depending on the dominant habitat type for the 0-30 meter depth zone in that area based on available fine-scale substrate data, shoreline type, kelp abundance, and expert knowledge.

MLPA North Coast Study Region
Round 1- North Coast External Proposed MPA Array E



California Marine Life Protection Act (MLPA) Initiative

0 5 10 20 Nautical Miles
0 5 10 20 Statute Miles
0 5 10 20 Kilometers

N

Projection Information:
Name: NAD 1983 California Teale Albers
Projection: Albers
Datum: North American 1983

Printing Date: February 17, 2010
Created by Marine Map Cartographic Division, UCSB.
For more information, visit http://www.northcoast.marinemap.org/marinemap/

Disclaimer:

This map represents a proposed external marine protected area (MPA) array that has been submitted by a north coast community group or groups for consideration in the MLPA planning process. This external MPA array is under review; it is NOT a recommendation to the California Fish and Game Commission.

California MLPA North Coast Study Region
Description of Marine Protected Areas (MPAs) in Array E
Document Revised February 17, 2010

Name of Array: North Coast External Proposed MPA Array E (ExE)
Author: S.E.A. (Students for Environmental Action)

Bioregions:
Northern: Oregon/California border to Mattole River
Southern: Mattole River to Alder Creek near Point Arena

Total number of MPAs:	**16**
Number of SMRs:	6
Number of SMCAs:	8
Number of SMPs:	1
Number of SMRMAs:	1
Number proposing tribal uses	1

MPA Name	MPA ID	Bioregion	MPA Boundaries (Exact or Approximate)	Designation	Level of Protection*	Propose Tribal Uses?	Proposed Take Regulations	Other Proposed Regulations
Pyramid Point SMR	73942	Northern Bioregion	State waters from the Oregon Border(42 00') southward to rocks immediately south of the Smith River mouth(42 56')(not including the Smith River), from, 42 00.00N/124 12.800W SSE to 41 59.700N/124 12.600W, S to 41 59.400N/ 124 12.600W, SSE to 41 59.200N/124 12.400W, S to 41 57.700N/124 12.400W, SSW to 41 57.700N/124 12.500W, SSW to 41 57.200N/124 12.700W, W to 41 57.200N/124 12.600W, S to 41 57.100N/124 12.600W, W to 41 57.100N/124 12.700W, to 41 57.00N/124 12.600W, SSE to 41 56.900N/124 12.500W, S to 41 56.700N/124 12.500, SSE to 41 56.00N/124 12.600W,41 56.700N/124 12.500 to 41 56.00N/124 12.300.	SMR	Very high	No	Take of all living marine resources is prohibited.	None specified

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MPA Name	Regional Goals/Objectives	Site-specific Rationale	Other Considerations
Pyramid Point SMR	N/A	The Pyramid Point SMR is proposed by the Del Norte MPA Work Group and based on the following Goals: G1,G2,G3,G4,G5,G6. Protects a diversity of habitats from the Oregon Border to the Smith River, seaward to federal waters. Includes rocky shores, beaches, shallow reef, soft bottom, and kelp forest habitats, a large off-shore island (Prince Island), and several off-shore rocks important for sea bird colonies and waterfowl (Aleutian geese). The reserve will enhance protections for marine mammals and Chinook salmon, steelhead and coastal cutthroat trout, and Threatened southern Oregon/Northern California Coastal Coho stocks, and protect kelp forest, red tail surf perch, smelt, nearshore rockfish, red abalone, razor clams and Dungeness crab.	Provides clear and enforceable boundaries with abundant coastal road, highway and trail access and vantage points. Provides vessel access (Port of Brookings, OR) for study or enforcement. Reduces distance from Crescent City to fishing grounds and improves safety of Crescent City fishers. Reduces economic impacts to sport and commercial fisheries in California's highest poverty level area. This SMR is clustered with the Pyramid Point SMCA and designed to recognize Native American traditional tribal shore uses that have occurred for thousands of years. Traditional Native American uses of this area, including subsistence and ceremonial shore use, have occurred since time immemorial and those uses are considered de minimis.

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Pyramid Point SMCA	73943	Northern Bioregion	From the Oregon Border south, and from the eastern boundary of Pyramid Point SMR shoreward along a line from: 42 00.00N/124 12.800W SSE to 41 59.700N/124 12.600W, S to 41 59.400N/ 124 12.600W, SSE to 41 59.200N/124 12.400W, S to 41 57.700N/124 12.400W, SSW to 41 57.700N/124 12.500W, SSW to 41 57.200N/124 12.700W, W to 41 57.200N/124 12.600W, S to 41 57.100N/124 12.600W, W to 41 57.100N/124 12.700W, to 41 57.00N/124 12.600W, SSE to 41 56.900N/124 12.500W, S to 41 56.700N/124 12.500, SSE to 41 56.00N/124 12.600W.	SMCA	High	Yes	Take of all living marine resources is prohibited.	Native American gathering for ceremonial, customary, and subsistence uses is allowed. Commercial, sport, or other consumptive use is not allowed.
False Klamath SMCA	73950	Northern Bioregion	NW 41 37' 124 11.5' SW 41 33' 124 10.5 NE 41 37' 124 06' SE 41 33' 124 05'	SMCA	Moderate high	No	The take of all living marine resources is prohibited except: 1. The recreational take of coastal pelagic finfish by hook and line; Dungeness crab by hoop net; Dungeness crab by diving; and Dungeness crab by trap. 2. The commercial take of coastal pelagic finfish by hook and line; and Dungeness crab by trap.	None specified

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MPA Name	Regional Goals/Objectives	Site-specific Rationale	Other Considerations
Pyramid Point SMCA	N/A	The Pyramid Point SMCA is clustered with the Pyramid Point SMR to protect intertidal species and habitats and recognize Native American ceremonial, customary, and subsistence gathering uses along intertidal zones of Tolowa ancestral territory.	Provides easy and efficient enforcement via various public access and vantage points from roads and highways. Native American uses of this area, including beach or nearshore gathering for subsistence and ceremonial purposes, have occurred since time immemorial. Those consumptive uses are considered de minimis. Enforcement officials can maintain lawful gathering by way of Native American card or other official identification.
False Klamath SMCA	N/A	The False Klamath cove is an area with abundant sea stacks rich in rocky shore and beach habitats. This SMCA will protect deeper sand and rock habitat in a region with high productivity. Examples of species most likely to benefit: nearshore, shelf and deeper nearshore rockfishes, lingcod, cabezon, kelp greenling, surfperches, kelp, Dungeness crab, murres, guillemots,cormorants, auklets, halibut, harbor seals, sea lions invertebrates and algae. Furthermore, this MPA may benefit marine birds and mammals by protecting their forage base and by potentially reducing human disturbance to roosting sites, haul-outs, breeding colonies, and rookeries.	There exists good coastal access for a large portion of this MPA.

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MPA Name	MPA ID	Bioregion	MPA Boundaries (Exact or Approximate)	Designation	Level of Protection*	Propose Tribal Uses?	Proposed Take Regulations	Other Proposed Regulations
Reading Rock SMR	73940	Northern Bioregion	MPA boundaries: North: 41 24.000 minutes to state water lboundary (Extension of inland MPA) then following state water boundary. West: Following state water line to 41 17.600 minutes North 124 12.000 minutes West South: Straight lines connecting the following points: 41 17.600 minutes North 124 12.000 minutes West, 41 21.400 minutes North 124 12.000 minutes West, 41 21.400 minutes North 124 08.000 minutes West East: 124 08.000 minutes (West boundary of Inland MPA)	SMR	Very high	No	Take of all living marine resources is prohibited.	None specified
Reading Rock SMCA	73939	Northern Bioregion	MPA boundaries: North: 41 24.000 minutes (Approximation of parking lot at end of road) West: 124 08.000 minutes (Approximation of 3nm state water boundary) South: 41 21.400 minutes (Approximation of Lagoon and Creek entrance) East: Mean high tide line	SMCA	Moderate high	No	The take of all living marine resources is prohibited except: 1. The recreational take of Dungeness crab by hoop net; Dungeness crab by diving; and Dungeness crab by trap. 2. The commercial take of Dungeness crab by trap.	None specified

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MPA Name	Regional Goals/Objectives	Site-specific Rationale	Other Considerations
Reading Rock SMR	N/A	This SMR with will protect a diverse number of species as well as a unique and complex habitat. It will improve fish productivity within a SMR, as well as benefiting local rockfish fishing outside the MPA as a result of spillover(G3)." Other species to benefit include; halibut, harbor seals, sealions, sharks, mussels, rays, kelp, murres, guillemots, cormorants, auklets, lingcod, cabezon, and kelp greenling.	None specified
Reading Rock SMCA	N/A	Reading Rock SMCA is an area that is rich in beach and soft bottom habitats. Significant nursery area for Dungeness crab, and numerous rockfish & flatfish species. (G2)	None specified

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MPA Name	MPA ID	Bioregion	MPA Boundaries (Exact or Approximate)	Designation	Level of Protection*	Propose Tribal Uses?	Proposed Take Regulations	Other Proposed Regulations
South Humboldt Bay SMRMA	73944	Northern Bioregion	The North boundary of the Marine Reserve is the 40 43' latitude line West to the sand spit East to the 124 14' longitudinal line South is amorphous including but not limited to; South Port Landing, and points east.	SMRMA	Very high	No	Take of all living marine resources is prohibited.	All marine non-extractive uses are permitted. Hunting is allowed.
False Cape SMCA	73947	Northern Bioregion	NW Corner: 40 33' 124 26.7' NE Corner: 40 33' 124 21.8' SW Corner: 40 30' 124 27.9' SE Corner: 40 30' 124 23'	SMCA	Moderate high	No	The take of all living marine resources is prohibited except the commercial take of coastal pelagic finfish by hook and line; and Dungeness crab by trap.	None specified

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MPA Name	Regional Goals/Objectives	Site-specific Rationale	Other Considerations
South Humboldt Bay SMRMA	N/A	This area is critical habitat for seabirds, migratory waterfowl, plants and Harbor Seals and other marine mammals, and is an important nursery for many marine and estuary fishes, including halibut. In addition, this area remain one of the key points for the millions of migratory birds that rely on the Pacific Flyway. More than 200 bird species, including 80 kinds of water birds and four endangered species, regularly feed, rest, or nest on the refuge or other areas around the bay. The bay provides habitat for approximately 100 species of fish, many of which contribute to sport or commercial fisheries, and provides habitat for steelhead, Coho, and Chinook salmon.	It is important to pair protection of the estuary system with existing protected areas on shore to maintain natural ecological linkages and recognize their critical role in ecosystem services. This also allows for rigorous monitoring due to the proximity of the existing research facility on land. This estuary habitat is in unique close proximity to a Wildlife Refuge on adjacent to the South Bay. This SMRMA is located in the South portion of Humboldt Bay, an area of the Bay that has little to no socioeconomic impacts for the community. There is extensive opportunities for ongoing research and public education including already existing activities by local schools, universities and interest groups.
False Cape SMCA	N/A	Protects a diversity of habitats including rocky shores, beaches, shallow reef, soft bottom, and several off-shore rocks important for sea bird colonies and mammals. This MPA protects benthic habitat and forage base for fish, birds and mammals, while allowing commercial fishing for finfish and Dungeness crab. (G1,G2,G3,G4,G5).	Ecotrust data indicates no salmon fishing impact.

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Punta Gorda SMR	73945	Southern Bioregion	North: 40 20.' Mean high tide to State waters 3 mi. offshore. SW corner: 40 14.4' 124 25.9' SE corner: 40 14.4' 124 20' SE corner approximate land mark: Sea Lion Gulch	SMR	Very high	No	Take of all living marine resources is prohibited.	None specified
Vizcaino SMCA	73938	Southern Bioregion	NW corner: 39 48.4' 123 55.7' NE corner: 39 48.4' 123 50.2' (S. side of Usal Rock) SW corner: 39 43' 123 53.9' SE corner: 39 43' 123 49.2'	SMCA	Moderate high	No	The take of all living marine resources is prohibited except the commercial take of salmon by troll; and Dungeness crab by trap.	None specified

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MPA Name	Regional Goals/Objectives	Site-specific Rationale	Other Considerations
Punta Gorda SMR	N/A	This SMR enlarges an already existing SMR at Punta Gorda continuing to protect natural ecosystem structure and function with minimal human-induced changes. It will maintain high benthic species abundance and biodiversity which is characteristic of the north coast region (G1). Protects natural trophic structure & food webs, including pelagic finfish that serve as prey for other fish, marine birds & marine mammals (G1). Provides protection to an area that contains one of most persistent & important upwelling plumes along entire California Coast & provides for significant downstream larval dispersal (G1). Protects larval sources & enhance reproductive capacity of shelf species including rockfishes (G2). Protects benthic habitat and forage base for fish, birds and mammals at islands, (G1,G2,G3,G4,G5) Increases supply of large adults & larval fish which can disperse to adjacent areas for fisheries harvest outside MPA (G3)	None specified
Vizcaino SMCA	N/A	The Viscaino State Marine Conservation Area will protect an area that is rich in primarily rocky shore habitat with a high diversity of benthic species characteristic of the north coast (G1). Marine mammal haul out spots and marine bird rookeries blanket the coastline.This SMCA will help protect larval sources and enhance reproductive capacity of shelf species including rockfishes (G2). Both soft and hard bottom habitat thresholds are met for 0-30m. Furthermore, this area will provide protection to area that contains one of most persistent and important upwelling plumes along entire California Coast and provides for significant downstream larval dispersal (G1). This dispersal will help restore depleted species, such as near shore and deeper nearshore species (G2).	Socioeconomic impacts were considered when developing the level of protection to allow commercial crabbing and salmon trolling. Another option is to split the MPA N-S allowing only Salmon fishing in the outer waters to increase the LOP. This MPA is positioned near the center of the bioregion South of Gorda capturing and protecting several key habitats defined by the SAT.

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California MLPA North Coast Study Region
Description of Marine Protected Areas (MPAs) in Array E
Document Revised February 17, 2010

MPA Name	MPA ID	Bioregion	MPA Boundaries (Exact or Approximate)	Designation	Level of Protection*	Propose Tribal Uses?	Proposed Take Regulations	Other Proposed Regulations
S.E.A. Ten Mile SMR	73949	Southern Bioregion	NW corner: 39 36.3' 123 51.5' NE corner: 39 36.3' 123 47.3' SW corner: 39 33' 123 50.5' SE corner: 39 33' 123 46.1' NE corner is Bruhel Point SE corner is just south of the mouth of Ten Mile River	SMR	Very high	No	Take of all living marine resources is prohibited.	None specified
S.E.A. Ten Mile Estuary SMR	73948	Southern Bioregion	Estuary extends from the mouth of Ten Mile River to an area upstream of approximately 1.4 miles.	SMR	Very high	No	Take of all living marine resources is prohibited.	None specified
S.E.A. Ten Mile Estuary SMR (continued)								

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California MLPA North Coast Study Region
Description of Marine Protected Areas (MPAs) in Array E
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MPA Name	Regional Goals/Objectives	Site-specific Rationale	Other Considerations
S.E.A. Ten Mile SMR	N/A	The heart of this SMR is the Ten Mile Estuary. This SMR helps maintain biodiversity in fish, invertebrates, seabirds and marine mammals associated with the protection of the ecosystem. This MPA has great diversity in unique marine habitats, including: exposed high-energy rocky shoreline, sand and gravel beaches, offshore islets, surf grass, kelp beds, and hard and soft substrates. The MPA interfaces with the complex estuarine habitats consisting of eelgrass beds, marshlands and mudflat ecosystems. (G1, G2,G3)	According to the Ecotrust information, this area has a low economic impact on crab and commercial rockfish fisheries. This MPA is adjacent to the mouth of the Ten Mile estuary (proposed SMR). Located at the North end of this MPA is an established marine monitoring site, that along with numerous coastal access points makes it easy for research, recreation and enforcement possible. (G5) This MPA is clustered with an adjacent Ten Mile SMR. (G1,G3, G3)
S.E.A. Ten Mile Estuary SMR	N/A	Estuaries not only support local fish and shellfish populations that are harvested commercially and recreationally, but these waters also serve as spawning and nursery grounds for populations that are harvested offshore. Estuaries rank along with tropical rainforests and coral reefs as the world's most productive ecosystems, more productive than both the rivers and the ocean that influence them from either side. (G1, G2, G4) This SMR protects larval source and enhance reproductive capacity of numerous invertebrate species such as dungeness crabs, ghost shrimp et al. (G1, G2, G4) This MPA expands on long-term protections for complex estuarine habitats, including eelgrass beds, marshlands and mudflat ecosystems.(G1, G2) Supports current DFG coho salmon and steelhead salmon habitat conservation projects while protecting essential nursery for federal and state listed threatened anadromous fish including Coho, King and Steelhead salmon. (G2)	None specified
S.E.A. Ten Mile Estuary SMR (continued)		Almost the entire stretch of this array is close to population centers, with numerous coastal access points making it easy for research, long- term monitoring, recreation and enforcement possible. (G3, G5)	

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California MLPA North Coast Study Region
Description of Marine Protected Areas (MPAs) in Array E
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MPA Name	MPA ID	Bioregion	MPA Boundaries (Exact or Approximate)	Designation	Level of Protection*	Propose Tribal Uses?	Proposed Take Regulations	Other Proposed Regulations
MacKerricher SMCA	74061	Southern Bioregion	This area is bounded by the mean high tide line, the 3-fathom depth contour and the following points: 39o 29.81' N. lat. 123o 47.50' W. long.; 39o 29.95' N. lat. 123o 47.80' W. long.; 39o 27.62' N. lat. 123o 48.80' W. long.; and 39o 27.55' N. lat. 123o 48.52' W. long.	SMCA	Low	No	The take of all living marine resources is prohibited except: 1. The recreational take of Finfish, red abalone, chiones, clams, cockles, rock scallops, native oysters, crabs, lobster, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.. 2. The commercial take of Finfish, crabs, ghost shrimp, jackknife clams, sea urchins, squid, algae except giant kelp and bull kelp and worms except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached.	None

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California MLPA North Coast Study Region
Description of Marine Protected Areas (MPAs) in Array E
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MPA Name	Regional Goals/Objectives	Site-specific Rationale	Other Considerations
MacKerricher SMCA	N/A	None	None

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California MLPA North Coast Study Region
Description of Marine Protected Areas (MPAs) in Array E
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MPA Name	MPA ID	Bioregion	MPA Boundaries (Exact or Approximate)	Designation	Level of Protection*	Propose Tribal Uses?	Proposed Take Regulations	Other Proposed Regulations
Point Cabrillo SMR	73941	Southern Bioregion	NW corner: 39 21.4' 123 53.6' NE corner: 39 21.4' 123 49.4' SW corner: 39 20.4' 123 53.6' SE corner: 39 20.4' 123 49.2'	SMR	Very high	No	Take of all living marine resources is prohibited.	None specified
Russian Gulch SMCA	73937	Southern Bioregion	NW Corner: 39 20.4' 123 53.6' SW Corner: 39 19.5' 123 53.1' NE Corner: 39 20.4' 123 49.2' SE Corner: 39 19.5' 123 48.'	SMCA	Low	No	The take of all living marine resources is prohibited except: 1. The recreational take of red abalone by free-diving. 2. The commercial take of sea palm by intertidal hand harvest; and urchin by diving.	None specified

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California MLPA North Coast Study Region
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MPA Name	Regional Goals/Objectives	Site-specific Rationale	Other Considerations
Point Cabrillo SMR	N/A	This SMR expands the size of the existing Point Cabrillo SMCA providing greater ecosystem protection at an existing MPA originally established as an "ecological reserve." It is clustered with the Russian Gulch SMCA. Point Cabrillo SMR protects and maintains the species diversity in shallow hard and soft bottom, kelp beds and rocky shore habitats.(G1) Protects larval source and enhance reproductive capacity of numerous invertebrate species such as Dungeness crab, limpets, mussels, turban snails, red abalone, black abalone, and finfish species including nearshore rockfishes. (G2)	Point Cabrillo reserve was designed small and clustered with Russian Gulch SMCA to minimize negative socioeconomic impact. This reserve has numerous coastal access points and will enhance the likelihood of MPA scientific studies.(G3) It also enhances educational/research use of accessible intertidal area by establishing a state marine reserve in a prime educational area, adjacent to three terrestrial state parks.(G3) Provides comparison analysis environment by providing a SMR across range of depths and fully accessible area within single reef complex. Provides the opportunity to study differences in relative abundance and size frequency of intertidal algal, vertebrate, and invertebrate species within a state marine reserve compared with an adjacent state conservation area with similar habitat. (G3) Almost the entire stretch of this array is close to population centers, with numerous coastal access points making it easy for research, long- term monitoring, recreation and enforcement possible.
Russian Gulch SMCA	N/A	This SMCA is located within a high energy rocky shoreline with offshore islets, surf grass, soft and hard substrates which helps maintain biodiversity in fish, invertebrates, seabirds and marine mammals associated with the protection of this significant ecosystem. This proposed SMCA enlarges the existing Russian Gulch SMCA and furthermore, it shares these same benefits with an adjacent proposed SMR.	The placement of a large SMR in this region would have significant economic impacts. But by clustering the Russian Gulch SMCA with the Point Cabrillo SMR we have the ability to locate a substantially larger marine protected that is both less economically constraining and more likely to serve the intended purpose of protecting biodiversity. In addition, SEA feels it is important to have educational and study opportunities. By having a SMR and a SMCA ecosystem side by side will allow one reserve to act as a control (which is an integral part to the scientific method) for biologists to compare the two types of reserves. This MPA is close to population centers, with numerous coastal access points making it easy for research, long- term monitoring, recreation and enforcement possible.

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MPA Name	MPA ID	Bioregion	MPA Boundaries (Exact or Approximate)	Designation	Level of Protection*	Propose Tribal Uses?	Proposed Take Regulations	Other Proposed Regulations
Big River Estuary SMP	73946	Southern Bioregion	Big River Estuary begins at the mouth of Big River from the highway 1 bridge and extends a distance of approximately 8.5 miles upstream.	SMP	Moderate high	No	The take of all living marine resources is prohibited except the recreational take of Dungeness crab by trap.	None specified

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MPA Name	Regional Goals/Objectives	Site-specific Rationale	Other Considerations
Big River Estuary SMP	N/A	Big River Estuary is the longest unaltered open-mouthed estuary in Northern California. This SMP is within the Mendocino Headlands State Parks and expands on long-term protections for complex estuarine habitats, including eelgrass beds, marshlands and mudflat ecosystems. (G1,G2,G4) Big River Estuary has the largest concentration of eel grass beds of all the estuaries in the southern part of the study region, significant mud flats and tidal marshes promoting a high biodiversity of fish, birds, and invertebrates. Protect essential habitat for Black Brandt geese and a key foraging area for shorebirds, coastal waterfowl (G2) Supports current DFG coho salmon and steelhead salmon habitat conservation projects throughout Big River Watershed. (G2) Protect elephant seal molting haul-out sites. (G2). Possible introduction site for the endangered California Clapper Rail(G1,G2)	This MPA is an area that has opportunities for a wide range of non-consumptive activities, such as diving, kayaking, beach-going, swimming, and shore and boat-based wildlife viewing. Almost the entire stretch of the estuary has access points making it easy for research, long- term monitoring, recreation and enforcement possible.

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MPA Name	MPA ID	Bioregion	MPA Boundaries (Exact or Approximate)	Designation	Level of Protection*	Propose Tribal Uses?	Proposed Take Regulations	Other Proposed Regulations
Van Damme SMCA	74066	Southern Bioregion	This area is bounded by the mean high tide line, the 3-fathom depth contour and the following points: 39o 16.45' N. lat. 123o 47.60' W. long.; 39o 16.355' N. lat. 123o 47.60' W. long.; 39o 16.27' N. lat. 123o 47.545' W. long.; and 39o 16.27' N. lat. 123o 47.43' W. long.	SMCA	Low	No	The take of all living marine resources is prohibited except: 1. The recreational take of Finfish, red abalone, chiones, clams, cockles, rock scallops, native oysters, crabs, lobster, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels. 2. The commercial take of Finfish, crabs, ghost shrimp, jackknife clams, sea urchins, algae except giant kelp and bull kelp and worms except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached.	None

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California MLPA North Coast Study Region
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MPA Name	Regional Goals/Objectives	Site-specific Rationale	Other Considerations
Van Damme SMCA	N/A	None	None

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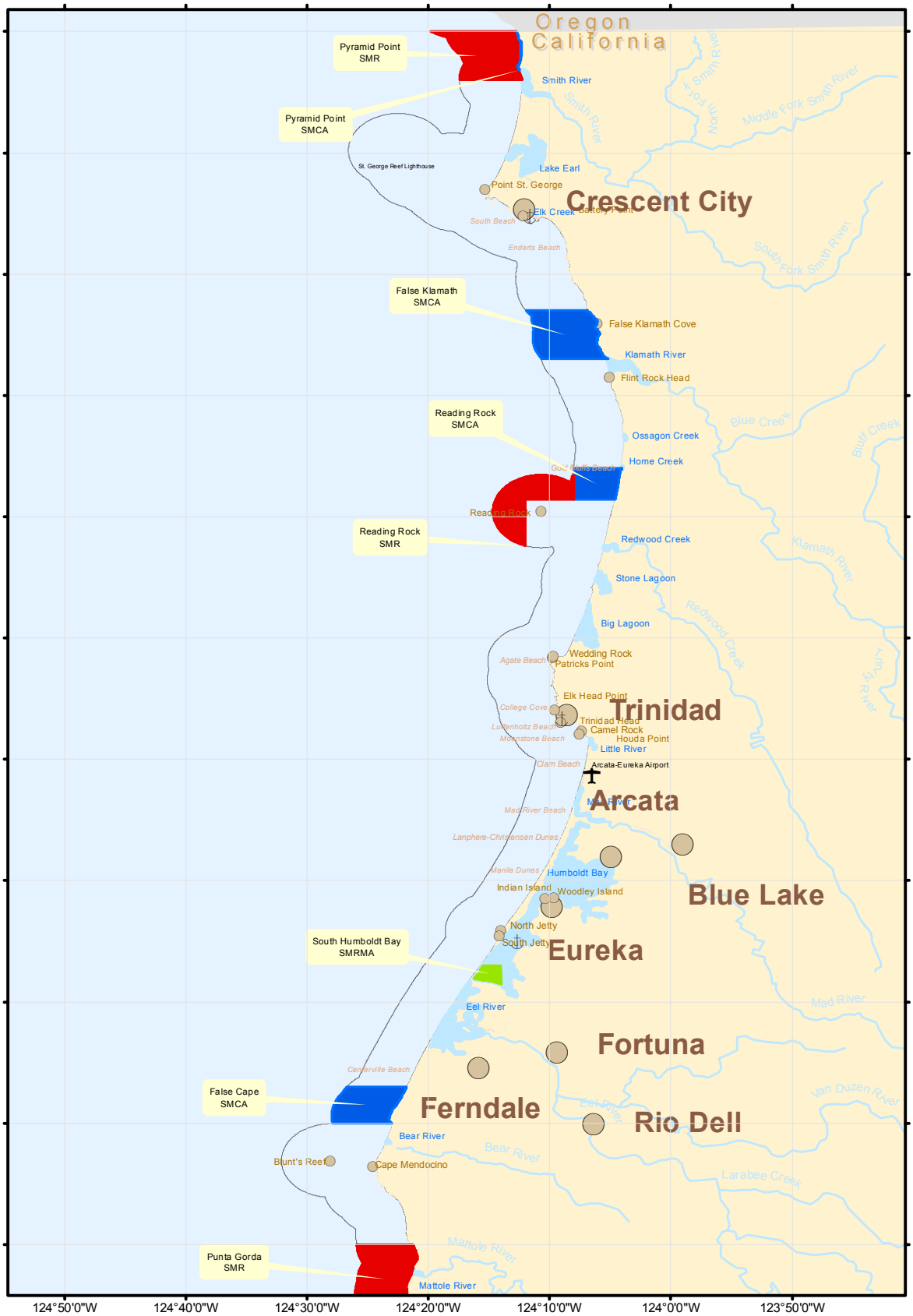
Consideration of Existing State MPAs in SEA's Array Proposal

Existing MPA	Retain (no changes to boundaries or regulations)	Modify (included with boundary or regulation change)	Remove (not included)
MacKerricher State Marine Conservation Area	RETAIN		
Point Cabrillo State Marine Conservation Area		MODIFY (Adjusted boundaries to meet DFG guidance, with SMR designation:Clustered with Russian Gulch SMCA)	
Russian Gulch State Marine Conservation Area		MODIFY (Adjusted boundaries to meet DFG guidance, with SMCA designation: clustered with Point Cabrillo SMR)	
Van Damme State Marine Conservation Area	RETAIN		
Manchester and Arena Rock State Marine Conservation Area	RETAIN		

MLPA North Coast Study Region Round 1 - North Coast External Proposed MPA Array E

Northern Bioregion (Oregon/California border to Mattole River)



California Marine Life Protection Act (MLPA) Initiative

0 2.5 5 10 Nautical Miles

0 3.5 7 14 Statute Miles

0 3.5 7 14 Kilometers

N

Date: 16 February 2010

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marine map

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Disclaimer:

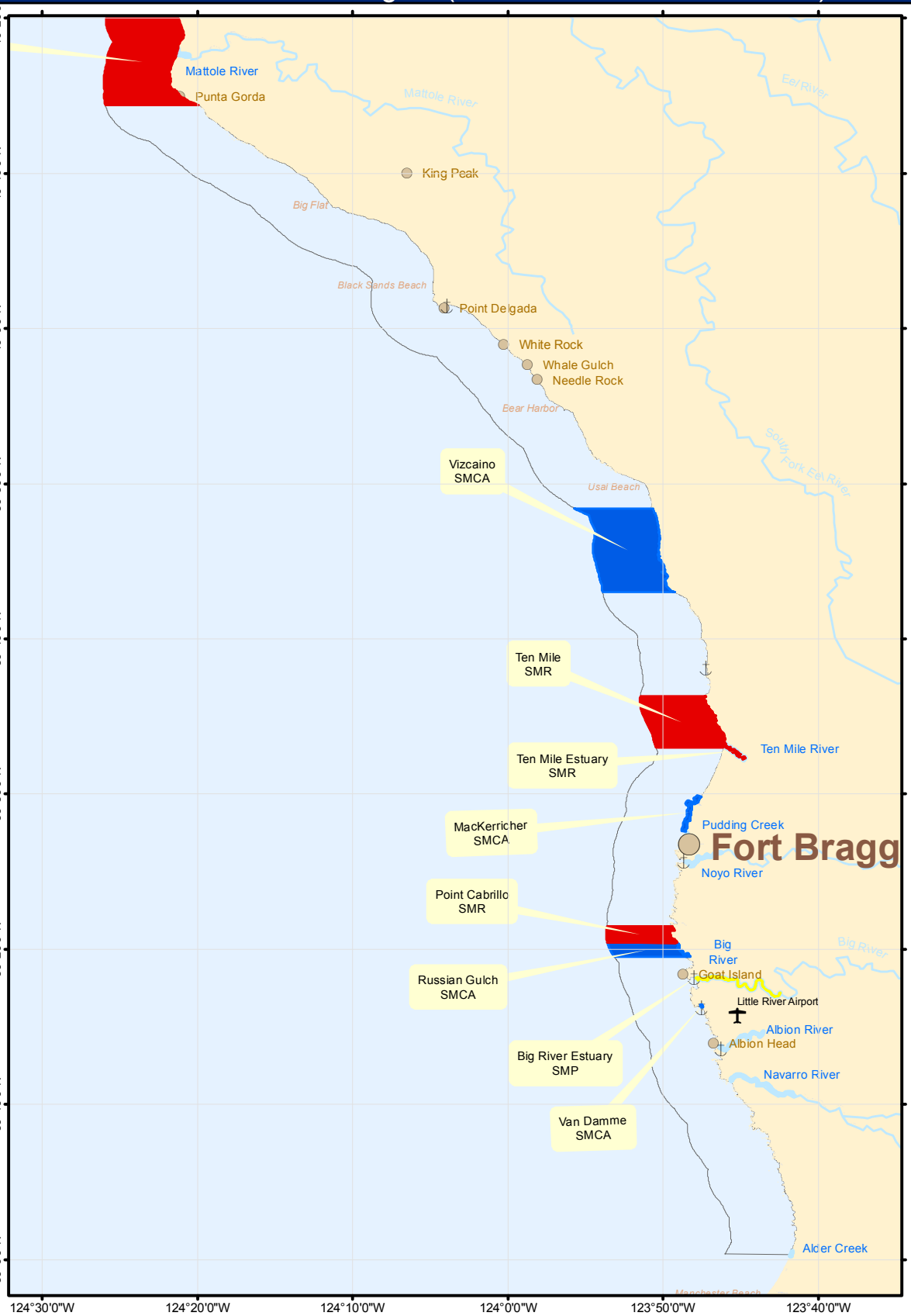
This map represents a proposed external marine protected area (MPA) array that has been submitted by a north coast community group or groups for consideration in the MLPA planning process. This external MPA array is under review; it is NOT a recommendation to the California Fish and Game Commission.

Legend

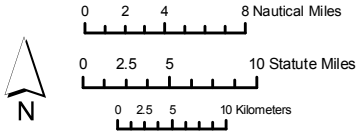
- North Coast Study Region Boundary
- Proposed Marine Protected Area Array
  - Proposed State Marine Reserve (SMR)
  - Proposed State Marine Conservation Area (SMCA)
  - Proposed State Marine Park (SMP)
  - Proposed State Marine Recreational Management Area (SMRMA)
- Estuaries
- Rivers
- Lighthouse
- Airport
- Coastal Point
- Major City
- Ports

MLPA North Coast Study Region Round 1 - North Coast External Proposed MPA Array E

Southern Bioregion (Mattole River to Alder Creek)



California Marine Life Protection Act (MLPA) Initiative



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Legend

- North Coast Study Region Boundary
- Proposed Marine Protected Area Array
  - Proposed State Marine Reserve (SMR)
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California MLPA North Coast Project
Habitat Calculations for North Coast External Proposed MPA Array E (ExE)
Document Revised on: March 3, 2010

	How Measured	Total Available Habitat	Pyramid Point SMR	Pyramid Point SMCA	False Klamath SMCA	Reading Rock SMR	Reading Rock SMCA
MPA ID			73942	73943	73950	73940	73939
MPA Designation			SMR	SMCA	SMCA	SMR	SMCA
Level of Protection			Very high	High	Moderate high	Very high	Moderate high
SAT Evaluation Bioregion			Northern	Northern	Northern	Northern	Northern
Area	sq miles	1,027.23	20.93	0.20	20.98	18.64	9.52
Alongshore Span	miles	NA	4.66	3.45	4.71	6.34	2.98
ESI Shoreline	miles	516.66	1.37	3.97	6.77	0.00	3.04
Min Depth	feet	0.00	0.00	0.00	0.00	90.00	0.00
Max Depth	feet	1,667.00	124.00	3.00	126.00	253.00	101.00
Beaches	miles	180.42	0.20	3.77	4.84	0.00	3.04
Rocky Shores	miles	159.08	1.18	0.19	1.79	0.00	0.00
Hardened Shores	miles	22.10	0.00	0.00	0.14	0.00	0.00
Coastal Marsh	miles	88.60	0.00	0.00	0.00	0.00	0.00
Coastal Marsh (area)	sq miles	3.51	0.00	0.00	0.00	0.00	0.00
Tidal Flats	miles	66.46	0.00	0.00	0.00	0.00	0.00
Humboldt Eelgrass	sq miles	7.07	0.00	0.00	0.00	0.00	0.00
Estuary	sq miles	43.49	0.00	0.00	0.00	0.00	0.00
Offshore Rocks	miles	140.73	2.53	0.35	1.73	0.00	0.00
Linear Kelp	miles	52.10	0.00	0.00	0.00	0.00	0.00
Hard (0 - 30m) Proxy	miles	54.01	0.43	0.00	0.69	0.00	0.00
Hard (0 - 30m)	sq miles	42.32	0.99	0.00	0.86	0.00	0.00
Hard (30 - 100m)	sq miles	45.08	0.00	0.00	0.00	0.38	0.00
Hard (100 - 200m)	sq miles	0.99	0.00	0.00	0.00	0.00	0.00
Hard (> 200m)	sq miles	0.09	0.00	0.00	0.00	0.00	0.00
Soft (0 - 30m) Proxy	miles	159.39	4.21	0.00	4.04	0.00	3.02
Soft (0 - 30m)	sq miles	252.26	14.76	0.00	9.17	0.17	7.91
Soft (30 - 100m)	sq miles	420.79	2.50	0.00	9.46	18.06	0.12
Soft (100 - 200m)	sq miles	62.48	0.00	0.00	0.00	0.00	0.00
Soft (> 200m)	sq miles	7.67	0.00	0.00	0.00	0.00	0.00
Unknown (0 - 30m) Proxy	miles	19.10	0.00	0.00	0.00	0.00	0.00
Unknown (0 - 30m)	sq miles	164.96	2.39	0.20	1.47	0.00	1.48
Unknown (30 - 100m)	sq miles	26.74	0.28	0.00	0.03	0.03	0.00
Unknown (100 - 200m)	sq miles	0.15	0.00	0.00	0.00	0.00	0.00
Unknown (> 200m)	sq miles	0.20	0.00	0.00	0.00	0.00	0.00

California MLPA North Coast Project
Habitat Calculations for North Coast External Proposed MPA Array E (ExE)
Document Revised on: March 3, 2010

	South Humboldt Bay SMRMA	False Cape SMCA	Punta Gorda SMR	Vizcaino SMCA	S.E.A. Ten Mile SMR	S.E.A. Ten Mile Estuary SMR	MacKerricher SMCA
MPA ID	73944	73947	73945	73938	73949	73948	74061
MPA Designation	SMRMA	SMCA	SMR	SMCA	SMR	SMR	SMCA
Level of Protection	Very high	Moderate high	Very high	Moderate high	Very high	Very high	Low
SAT Evaluation Bioregion	Northern	Northern	Southern	Southern	Southern	Southern	Southern
Area	2.44	15.20	25.96	23.59	15.08	0.19	0.72
Alongshore Span	N/A	3.59	6.44	6.32	3.92	N/A	3.02
ESI Shoreline	3.39	4.28	7.94	8.97	9.17	3.24	4.50
Min Depth	N/A	0.00	0.00	0.00	0.00	N/A	0.00
Max Depth	N/A	155.00	1667.00	395.00	344.00	N/A	38.00
Beaches	0.00	3.00	3.30	3.69	1.51	0.42	1.57
Rocky Shores	0.28	1.17	4.64	5.28	7.66	0.51	2.93
Hardened Shores	0.00	0.11	0.00	0.00	0.00	0.00	0.00
Coastal Marsh	2.25	0.00	0.00	0.00	0.00	2.30	0.00
Coastal Marsh (area)	0.05	0.00	0.00	0.00	0.00	0.05	0.00
Tidal Flats	0.86	0.00	0.00	0.00	0.00	0.00	0.00
Humboldt Eelgrass	0.92	0.00	0.00	0.00	0.00	0.00	0.00
Estuary	2.44	0.00	0.00	0.00	0.00	0.19	0.00
Offshore Rocks	0.00	0.77	2.14	3.81	2.77	0.00	3.56
Linear Kelp	0.00	0.00	0.38	2.16	2.90	0.00	0.00
Hard (0 - 30m) Proxy	0.00	0.23	2.52	2.62	1.26	0.00	0.00
Hard (0 - 30m)	0.00	0.16	1.37	1.34	0.69	0.00	0.09
Hard (30 - 100m)	0.00	0.00	2.54	0.20	0.73	0.00	0.00
Hard (100 - 200m)	0.00	0.00	0.27	0.00	0.00	0.00	0.00
Hard (> 200m)	0.00	0.00	0.05	0.00	0.00	0.00	0.00
Soft (0 - 30m) Proxy	0.00	0.45	4.75	3.77	2.65	0.00	0.00
Soft (0 - 30m)	0.00	0.60	1.96	3.51	1.92	0.00	0.04
Soft (30 - 100m)	0.00	0.20	11.62	13.27	10.09	0.00	0.00
Soft (100 - 200m)	0.00	0.00	3.22	3.91	0.68	0.00	0.00
Soft (> 200m)	0.00	0.00	2.40	0.00	0.00	0.00	0.00
Unknown (0 - 30m) Proxy	0.00	3.02	0.00	0.00	0.00	0.00	0.00
Unknown (0 - 30m)	2.44	4.93	2.51	1.37	0.97	0.19	0.59
Unknown (30 - 100m)	0.00	9.31	0.00	0.00	0.00	0.00	0.00
Unknown (100 - 200m)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unknown (> 200m)	0.00	0.00	0.02	0.00	0.00	0.00	0.00

California MLPA North Coast Project
Habitat Calculations for North Coast External Proposed MPA Array E (ExE)
Document Revised on: March 3, 2010

	Point Cabrillo SMR	Russian Gulch SMCA	Big River Estuary SMP	Van Damme SMCA
MPA ID	73941	73937	73946	74066
MPA Designation	SMR	SMCA	SMP	SMCA
Level of Protection	Very high	Low	Moderate high	Low
SAT Evaluation Bioregion	Southern	Southern	Southern	Southern
Area	4.76	4.27	0.34	0.02
Alongshore Span	1.28	1.09	N/A	0.20
ESI Shoreline	4.17	3.94	5.69	0.35
Min Depth	0.00	0.00	N/A	0.00
Max Depth	404.00	402.00	N/A	11.00
Beaches	0.00	0.00	1.10	0.35
Rocky Shores	4.17	3.94	0.76	0.00
Hardened Shores	0.00	0.00	0.00	0.00
Coastal Marsh	0.00	0.00	3.55	0.00
Coastal Marsh (area)	0.00	0.00	0.05	0.00
Tidal Flats	0.00	0.00	0.28	0.00
Humboldt Eelgrass	0.00	0.00	0.00	0.00
Estuary	0.00	0.00	0.34	0.00
Offshore Rocks	2.41	2.90	0.00	0.10
Linear Kelp	0.85	1.19	0.00	0.00
Hard (0 - 30m) Proxy	0.78	0.43	0.00	0.00
Hard (0 - 30m)	0.38	0.38	0.00	0.00
Hard (30 - 100m)	0.08	0.04	0.00	0.00
Hard (100 - 200m)	0.04	0.00	0.00	0.00
Hard (> 200m)	0.00	0.00	0.00	0.00
Soft (0 - 30m) Proxy	0.54	0.62	0.00	0.00
Soft (0 - 30m)	0.34	0.49	0.00	0.00
Soft (30 - 100m)	1.82	1.33	0.00	0.00
Soft (100 - 200m)	1.86	1.87	0.00	0.00
Soft (> 200m)	0.00	0.00	0.00	0.00
Unknown (0 - 30m) Proxy	0.00	0.00	0.00	0.00
Unknown (0 - 30m)	0.24	0.16	0.20	0.02
Unknown (30 - 100m)	0.00	0.00	0.00	0.00
Unknown (100 - 200m)	0.00	0.00	0.00	0.00
Unknown (> 200m)	0.00	0.00	0.00	0.00